

**REMARKS**

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

**Claim Amendments**

Claims 1 and 3-5 have been amended to recite that the catalyst is at least one heavy metal selected from the group consisting of cobalt (Co), manganese (Mn) and iron (Fe). Support for this amendment is found on page 6, lines 20-22 of Applicants' specification.

Claims 2-5 have been amended to delete the phrase "in the presence of a catalyst" from step E.

The claims have also been amended to make changes of an editorial nature, in order to better comply with U.S. practice.

No new matter has been added to the application by these amendments.

**Rejections of Claims Under 35 U.S.C. § 112, First Paragraph**

The rejection of claims 1 and 3-5 under 35 U.S.C § 112, first paragraph, as not being enabled for all oxidation catalysts in the field of chemistry, has been rendered moot in view of the above-discussed claim amendments.

The rejection of claims 2-5 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement, has also been rendered moot in view of the above-discussed claim amendments. According to Applicants' invention, the use of a reducing catalyst is not an essential requirement. Based upon the teachings of the specification, as well as the many prior art references cited by the Examiner, a person of ordinary skill in the art would be able to make the decision to not to use a reducing catalyst, and also to select a suitable reducing catalyst, in embodying the invention claimed in any of claims 2-5 without undue experimentation and without undue trials and errors.

**Patentability Arguments**

The patentability of the present invention over the disclosure of the reference relied upon by the Examiner in rejecting the claims will be apparent upon consideration of the following remarks.

**Rejection Under 35 U.S.C. § 103(a)**

The rejection of claims 1-16 under 35 U.S.C. § 103(a) as being unpatentable over Packer et al. (U.S. 4,438,279) is respectfully traversed.

The Examiner takes the position that Packer et al. teach a process of producing terephthalic acid by oxidation of para xylene and the catalytic hydrogenation of the crude terephthalic acid. The Examiner admits that Applicants' invention differs from the prior art in that the claimed internal energy possessed by the terephthalic acid cakes or liquid on it does not specify its use for evaporating the liquid in the cake. However, the Examiner states that the prior art does teach that "hot pressurized mixture of vapors can be used to heat either the oxidation effluent or a heat exchange fluid that can be used in a thermodynamic energy conversion." The Examiner takes the position that it would have been obvious to one of ordinary skill in the art to use the heat from "hot pressurized mixture of vapors" in order to evaporate the liquid in the cake so as to economize the energy consumption during the process.

Applicants' respectfully disagree.

Applicants' claims require the following two features:

1. The solid-liquid separation step (Step (B) and/or Step (G)), and the step of cleaning the crude terephthalic acid cakes (Step (C) and/or Step (H)), are carried out using a single common device under a pressure not less than the atmospheric pressure.
2. Internal energy is used as at least a portion of the energy for evaporating the liquid remaining in or on the terephthalic acid cakes in Step (D) or Step (I).  
(This means that the liquid remaining in or on the cakes is evaporated by flash evaporation.)

Because the solid-liquid separation step and the cleaning step are carried out under a pressure not less than the atmospheric pressure, the internal energy of the terephthalic acid cakes is kept high, so that after these steps, the liquid remaining can be evaporated extremely efficiently by flash evaporation. Also, since the solid-liquid separation step and the cleaning step are carried out using a single common device, these steps can be carried out easily under the same pressure.

The Packer reference discloses that “The first vapors flashed while decompressing from the hydrogen free solution to the first crystallization pressure...may...also contain vapors of p-toluic acid stripped from solution by the flash vapors of water and acetic acid. Such hot pressurized mixture of vapors can better be used to heat either the oxidation effluent or a heat exchange fluid which can be used in a thermodynamic energy conversion....” (Please see column 5, lines 17-26 of the reference.) However, the reference is silent about removing any liquid remaining by flash evaporation from the terephthalic acid cakes after the solid-liquid separation and cleaning steps, as required by Applicants' claims.

As disclosed in Packer, it is well known that when a solvent is flashed, impurities dissolved in the solvent, such as p-toluic acid, tend to deposit. Thus, in the arrangement of Packer, if trials were made to remove any liquid remaining from the terephthalic acid cakes by flash evaporation, there is the strong possibility that the cakes may be polluted with impurities (such as p-toluic acid and 4-CBA). This lowers the purity of the terephthalic acid.

The object of Packer is to improve the purity of terephthalic acid. As mentioned above, if trials were made to remove any liquid remaining by flash evaporation, the purity of the terephthalic acid would deteriorate. MPEP 2143.01 states that if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984). In this case, modifying the teachings of the reference to remove any liquid remaining by flash evaporation would deteriorate the purity of terephthalic acid, and thus render the patent unsatisfactory for its

intended purpose. Thus, contrary to the Examiner's assertion, this modification is not suggested by the reference.

Additionally, Packer is completely silent about "carrying out the solid-liquid separation step and the cleaning step under a pressure not less than the atmospheric pressure, using a single common device", as required by Applicants' claims.

For these reasons, the invention of Applicants' claims 1-16 is clearly patentable over the cited reference.

**Conclusion**

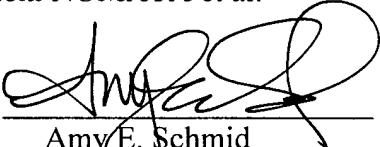
Therefore, in view of the foregoing amendments and remarks, it is submitted that each of the grounds of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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